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10/629,299

HT3920 US NA

RESPONSE

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Rev. 10/93

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN THE APPLICATION OF:

**REIYAO ZHU**

CASE NO.: HT3920USNA

SERIAL NO.: 10/629,299

GROUP ART UNIT: 1771

FILED: JULY 28, 2003

EXAMINER: JENNA LEIGH BEFUMO

FOR: **FLAME RETARDANT FIBER BLENDS COMPRISING MODACRYLIC FIBERS  
AND FABRICS AND GARMENTS MADE THEREFROM**

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**RESPONSE**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**Introductory Comments**

Reconsideration is respectfully requested of the rejection of claims 1-18 set forth in the Office communication dated August 29, 2005. These claims are maintained without amendment since all claims in their present form represent a patentable advance in the art.

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**Additional Information**

In keeping with a spirit of a complete disclosure, it is pointed out that an obviousness-type double patenting rejection has been received in Serial No. 10/803,383 filed March 18, 2004 based on claims of the present patent application.

A Terminal Disclaimer is being filed in Serial No. 10/803,383 to overcome the obviousness-type double patenting rejection based on claims in this patent application.

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**Double Patenting**

Claims 1-19 stand rejected based on obviousness-type double patenting based on claims 1-20 of application Serial No. 630,102 in view of Edwards GB 2152542A.

Although 10/630,102 and the present application were filed on the same day, such that no timewise extension would be applicable, pursuant to normal prosecution and timely responses by the USPTO, nevertheless the double patenting rejection is traversed.

The claimed subject matter in both applications is common for an aramid staple fiber and a polyamide staple fiber. However, the applications differ in the present application requiring a modacrylic fiber while 10/630,102 requires specific classes of flame retardant cellulosic staple fibers.

Accordingly, the Office rejection acknowledges the fact in the following:

Thus, 10/630,102 claims a blend using fire retardant cellulosic fibers instead of modacrylic fibers.

Concerning Edwards, the Office rejection states:

Edwards discloses fire retardant fabrics can be made from yarns comprising blends of fire retardant fibers selected from the group consisting of aramid fibers, modacrylic fibers, fire retardant polyester fibers, and fire retardant viscose fibers (abstract). The fire retardant fibers have different fire retardant characteristics and physical properties such as wear resistance, strength, hand, and dimensional stability (page 1, lines 14 – 20).

Then the Office rejection makes the following general statement:

Thus, picking the fire retardant fibers in the blend allows one of ordinary skill in the art to optimize or customize the fire retardant and physical properties of the finished fabric for the specific end use of the fire retardant fabric (page 1, lines 108 – 130).

However, this statement by Edwards is specific to the named materials disclosed in this publication.

The Office rejection continues with the following conclusion:

Therefore, it would have been obvious to one having ordinary skill in the art to substitute known fire retardant viscose fibers for the modacrylic

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fibers used in the blend claimed by the applicant since Edwards discloses the types of fire retardant fibers in the blend can be chosen to customize or optimize the fire retardant properties as well as the physical properties the fibers bring to the end product such as comfort, texture, wear resistance, strength and dimensional stability.

This position and conclusion is directly traversed. The rejection is predicated on modifying the disclosure of Serial No. 10/630,102 by the teachings of Edwards rather than Edwards in view of 10/630,102.

However, more importantly, irrespective of the order of publications, the Office position is based on a generalization, namely a number of properties are present directed to (1) fire retardancy, (2) comfort, (3) texture, (4) wear resistance, (5) strength and (6) dimensional stability.

It is considered unobvious to provide a solution to these properties based on the claims of 10/630,102 and Edwards.

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**Rejection Under 35 USC 103(a)**

Claims 1-19 stand rejected under 35 USC 103(a) based on Ichibori et al. USP 5,503,916 in view of Edwards.

The Office rejection initially sets forth the disclosure of Ichibori et al. in the following:

Ichibori et al. discloses a flame retardant fiber blend comprising 15 to 85 parts by weight of a flame retardant fiber comprising a polymer containing a halogen and Sb component and 85 to 15 parts by weight of a fiber selected from the group of natural and chemical fibers (abstract). The blending ratios is chosen based on the flame resistance required in the end product and the other desired properties such as appearance, touch, hygroscopic properties, washing resistance, durability and the like of the end product (column 4, lines 15 - 24).

The Office rejection continues:

The flame retardant fiber is a modacrylic fiber produced by reacting a halogen containing polymer such as vinylidene chloride or copolymers of an acrylonitrile and vinylidene chloride (column 2, lines 43- 67).

A reading of column 2, lines 43-67 is as follows:

Typical examples of such a halogen-containing polymer are, for instance, homopolymers or copolymers of halogen-containing vinyl monomers such as vinyl chloride, vinylidene chloride, vinyl bromide and vinylidene bromide; copolymers of a halogen-containing vinyl monomer and acrylonitrile such as acrylonitrile-vinylidene chloride, acrylonitrile-vinyl chloride, acrylonitrile-vinyl chloride-vinylidene chloride, acrylonitrile-vinyl bromide, acrylonitrile-vinylidene chloride-vinyl bromide, and acrylonitrile-vinyl chloride-vinyl bromide copolymers; copolymers of at least one halogen-containing vinyl monomer such as vinyl chloride, vinylidene chloride, vinyl bromide or vinylidene bromide, acrylonitrile and a vinyl compound copolymerizable with the halogen-containing vinyl monomer and acrylonitrile; acrylonitrile homopolymer to which a halogen-containing compound such as chloroparaffine, decarbomodiphenyl ether, and brominated

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bisphenol A and derivates is added; halogen-containing polyesters, polyester fibers obtained by impregnating with halogen-containing compound such as hexabromocyclododecane; and the like, but the halogen-containing polymers used in the invention are not limited thereto. The polymers may be employed alone or in admixture thereof.

Yet it is considered necessary to read these words in light of the introductory preceding statements appearing before column 2, lines 43-67, namely column 2, lines 30-40:

In the present invention, a fiber prepared from a composition containing a polymer containing 17 to 86% by weight, preferably 17 to 73% by weight, of a halogen, and \_\_\_ to 50% by weight of an Sb compound based on the polymer is employed.

The polymer containing 17 to 86% by weight of a halogen employed in the invention includes, for instance, a polymer of a halogen-containing monomer, a polymer in which a halogen-containing compound is added, a polymer impregnated with halogen by after-treatment of the polymer in the form of fiber, and the like.

Thus, Ichibori et al. are directed to introducing 17-86% by weight halogen and up to 50% by weight of an Sb compound in a polymer.

Then the Office rejection continues to introduce a disclosure of a polyamide in the following wording:

When the flame retardant fibers comprises more than 85% by weight of the blend, the end product will have excellent fire resistance, but the other properties such as appearance, touch, wash resistance, hygroscopic property, and durability are not sufficient (column 4, lines 30 - 36). The natural and chemical fibers which can be added alone or combined together, to the fire retardant fiber to improve the comfort and additional properties of the fabric include cotton, viscose rayon, nylon, and the like (column 4, lines 52 - 64).

Yet, a complete reading of column 4, lines 52-64:

Examples of the natural fibers to be blended with the fiber (A) are, for instance, vegetable fibers such as cotton, flax and ramie, animal fibers such as sheep wool, camel hair, goat hair and silk, and the like. Examples of the chemical

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fiber to be blended with the fiber (A) are, for instance, regenerated fibers such as viscose rayon fibers and cuprammonium rayon fibers, semi-synthetic fibers such as cellulose acetate fibers, synthetic fibers such as nylon fibers, polyester fibers and acrylic fibers, and the like. These natural and chemical fibers are not limited to such exemplified fibers. The natural and chemical fibers may be employed alone or in admixture thereof.

So an extensive list of potentially suitable materials is present.

The point applicant is making is that Ichibori et al. have broad, extensive lists in which the office rejection is premised on picking and choosing. Moreover, the invention is Ichibori et al. is directed to imparting extremely large percentages of halogen and Sb in combination into a fiber. This invention totally differs from the present intimate blend of fibers as evidenced by the present claims.

Then the Office rejection summarizes its position and the deficiency in Ichibori et al. in the following:

While Ichibori et al. discloses a fire retardant fabric made from a yarn comprising modacrylic fibers and polyamide (or nylon) fibers, Ichibori et al. fails to teach adding aramid fibers to the blend.

Applicant directly and emphatically states that this position of what Ichibori et al. disclose is an oversimplification and misreading in application to the present claimed subject matter. This position of what Ichibori et al. disclose has been set forth in wording from column and line numbers. In contrast the Office position is predicated on ignoring applicable disclosure of Ichibori et al. in support of the Office rejection.

To cure the deficiency of Ichibori et al., the Office rejection turns to Edwards. The Office position is as follows:

Edwards is drawn to a fire retardant fabric made from a blend of fire retardant fibers. Edwards discloses that fire retardant fibers have different fire retardant characteristics and also differ in other properties such as wear resistance, strength, hand, and dimensional stability (column 1, lines 14 – 20). The fiber blend is based on various factors and is usually a compromise between performance and cost (page 1, lines 20 – 27). Aramid fibers can be added to fabrics for abrasion or wear resistance, while modacrylic fibers are added for comfort (page 1, lines 17 – 120). Additionally,



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Edwards discloses blended staple yarns blends of modacrylic and aramid fibers (page 2, lines 15 – 20).

Accordingly, the Office conclusion is:

Thus, it would have been obvious to one having ordinary skill in the art to add an additional fire retardant fiber such as aramid to the blend taught by Ichibori et al. since the blend will maintain desired fire resistance of the end product while improving the wear or abrasion resistance of the fabric and still producing a fabric with improved comfort and appearance properties. Further, it would have been obvious to one having ordinary skill in the art to one of ordinary skill in the art to optimize the amount of each fiber type in the final product based on the desired wear, comfort, and appearance properties of the end product. Therefore, claims 1 – 3, 8, and 9 are rejected.

The Office position is an oversimplification and inaccurate portrayal of Edwards. Attention is respectfully directed to page 1, lines 32 to 37 of this publication as follows:

The invention comprises a fire retardant fabric comprising a mixture of three different fibres each of which is selected from a different one of the group consisting of aramid fibre, modacrylic fibre, fire retardant polyester fibre and fire retardant viscose fibre.

Thus, a clear teaching of Edwards is to pick three of four fibers from (1) aramid, (2) modacrylic, (3) fire retardant polyester, and (4) fire retardant viscose.

Applicant directly states that one of ordinary skill in the art would not be able to derive the claimed invention of a specific, named intimate blend of staple fibers. Moreover, one of ordinary skill in the art could not go further and derive these fibers in the amounts required in the present claims.

For claims 4, 5, 6 and 7, the Office rejection relies on obviousness for the type of aramid fibers. In response, further criticality is present in the dependent claims and these claims represent a patentable advance in the art for the same reasons as the parent claims.

For claims 10-19, the office position:

One of ordinary skill in the art would be motivated to choose a fabric which would be light and comfortable to wear while also producing a fabric which is sufficiently heavy enough to protect the user for fire and related dangers. Therefore, claims 10 – 19 are rejected.

The broad brush allegation is considered without merit for reasons previously set forth.

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Claims 1-19 stand rejected under 35 USC 103(a) based on Edwards in view of Ichibori et al. Thus, a reversal of publications is present opposite the previous rejection and traversal thereof.

Only brief remarks are believed necessary to traverse this rejection.

As set forth, Edwards require 3 of 4 fibers from (1) aramid, (2) modacrylic, (3) fire retardant polyester, and (4) fire retardant viscose.

It is submitted that one of ordinary skill in the art could not arrive at the present claimed invention with a combination of Ichibori et al. The disclosure of this latter publication has been discussed in detail above.

Claims 1-19 stand rejected based on Ichibori et al. in view of Campbell et al. 6,787,228 B2. The Office rejection states:

The features of Ichibori et al. have been set forth above. Ichibori et al. discloses a fiber blend comprising modacrylic and nylon fibers, but fails to teach adding aramid fibers to the blend.

Again, applicants directly state the Ichibori et al. cannot be combined with a secondary publication to arrive at the present claimed invention.

Again, the number of deficiencies of Ichibori et al. have been set forth in detail.

The Office rejection states:

Campbell et al. is drawn to flame resistant fabrics made from a blend of fibers. The fiber blend comprises at least 70% modacrylic fibers and at least 3% high performance, high energy absorptive fibers of material having a tenacity of at least about 4 grams/denier, flame resistance, affinity for high visibility dye stuffs, and good energy absorption (column 4, lines 9-14).

This disclosure of Campbell et al. is insufficient to cure the deficiencies in Ichibori et al.

Accordingly, the combination of publications must fail.

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In summary, all rejections have been traversed without amendment of the claims. A notice of allowance is solicited.

Respectfully submitted,



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Dated: November 22, 2005